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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G06K 9/00, B42D 15/00, H04K 1/00 — A1

(11) International Publication Number: **WO 99/66448**

(43) International Publication Date: 23 December 1999 (23.12.99)

(21) International Application Number: PCT/US99/13735

(22) International Filing Date: 17 June 1999 (17.06.99)

(30) Priority Data:
09/098,936 17 June 1998 (17.06.98) US

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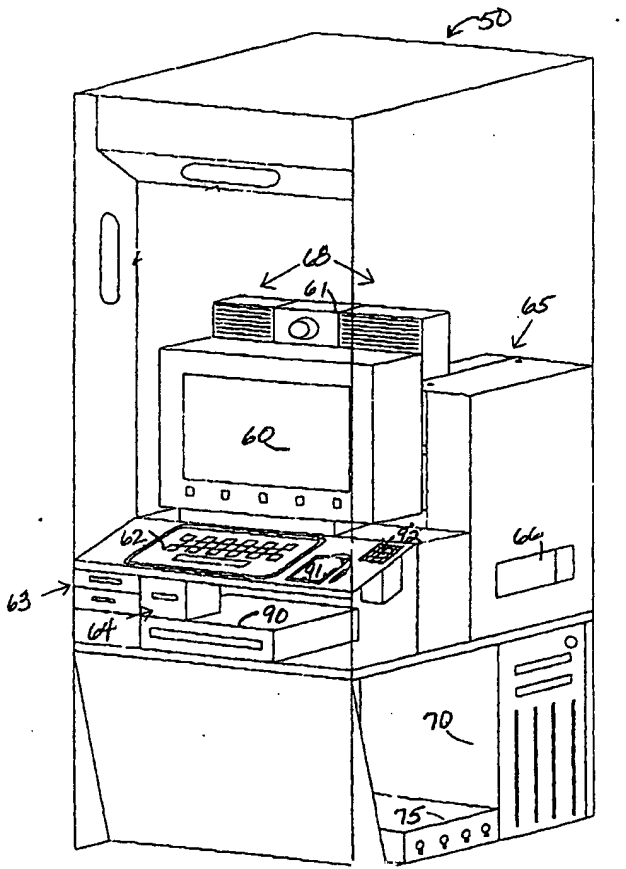
(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: IDENTIFICATION SYSTEM FOR PRODUCING DOCUMENTS

(57) Abstract

A method and system for producing identification documents. The system comprises a verification system (50) which determines the identity of a user. The verification system includes, for example, a camera (61), a keyboard (62), a fingerprint imaging device (92) or an electronic scanning device (90). The system compares input data with prestored data to determine if the identity of the user can be established. The system can analyze images, fingerprints, social security numbers or any other type of identifying data. The system produces various identification documents including passports, driver's licenses, membership cards or credit cards upon a positive identification of the applicant.



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IDENTIFICATION SYSTEM FOR PRODUCING DOCUMENTS

Background of the Invention

Field of the Invention

The invention pertains to the field of identification systems. More particularly, the invention pertains to a photo kiosk which gathers information for the production of an identification document.

Description of the Related Art

Various types of photo kiosks have been used for applications such as producing self-photographs, and for making amusement and novelty pictures. Generally, one type of such photo kiosks takes a series of photographs or a single photograph of a user situated in front of the camera within a booth or in front of a kiosk panel. The photographs are then processed within the structure and the finished prints are output and delivered to the user.

Other types of photo kiosks have allowed the user to select a computer generated background or foreground for integration with the user's image. The images are combined by the equipment within the booth, and the end product, typically a hard copy of the combined image, is delivered to the user. Examples of such automatic photography equipment can be found in U.S. Patent No. 5,343,386 entitled APPARATUS FOR MAKING ELECTRONICALLY-PRODUCED POSTCARDS AND METHOD OF OPERATING THE SAME which is assigned to the assignee of the present invention.

However, kiosk technology is currently lacking the ability to automatically create identification documents. These identification documents require verification of the identity of the individuals receiving the documents before they are produced. Government agencies, banks, businesses, and credit card agencies need a kiosk system with a verification system which would provide for the remote dispensal of such documents.

Such a kiosk system would be advantageous when an individual travels to a remote location and the individual looses one or more critical documents. The documents could include a social security card, a driver's license, credit cards, passports, membership cards, or travelers checks. However, currently, there does not exist a method by which a state agency could re-issue a driver's license without the individual physically going to the issuing agency. Similarly, no means exists for a government agency to remotely provide a passport. The passport issuer would traditionally need to send the replacement passport to the registered home address of the cardholder. A need exists to be able to produce each of the aforementioned documents at a remote location for the unlucky traveler.

Further, a need exists for a kiosk system which would eliminate the need for the physical presence of an operator. The cost of hiring and training operators to receive the appropriate information from an individual and prepare various identification documents is a significant overhead in producing such documents.

Moreover, a kiosk system is needed which would obviate the long lines that are often associated with obtaining identification documents. Producers of identification documents need a system by which an applicant can

provide necessary information in advance of arriving to pick-up the requested document. Once the applicant arrives, the applicant need not re-provide the information and may expeditiously pick up the identification document.

In light of the above, it is apparent that various entities, such as government agencies, banks, and credit card companies are in need of a kiosk system which can produce documents in a secure manner to an individual, whose identity can be determined.

Summary of the Invention

One embodiment of the invention includes an imaging apparatus for generating an identification document, comprising a central processing unit, a memory storage unit coupled to the central processing unit and configured to store a digital image of a user, at least one input device coupled to the central processing unit and configured to receive identification data which identifies the user, a camera coupled to the central processing unit and configured to capture a portrait image, a verification system which verifies the identity of the user by comparing the identification data from the at least one input device with a set of verification information, and a printer for generating an identification document upon an electronic request from the central processing unit, wherein the identification document includes the portrait image.

Another embodiment of the invention includes an identification system for automatically verifying the identity of a user posed at the identification system, the identification system comprising a camera which captures a portrait image of the user posed in a region provided at the identification system, a display positioned so as to be visible to the user when the user is within the region and which displays to the user a real time user image captured by the camera, at least one input device which enables the user to input identifying information, a central processing unit which converts the portrait image to digital data acceptable for electronic transmission, and a verification system which, upon an electronic request from the central processing unit, determines the identity of the user by analyzing the portrait image and the identifying information.

Brief Description of the Drawings

Figure 1 is a perspective view of an identification system according to one embodiment of the invention.

Figure 2 is a block diagram illustrating the components of an identification system in accordance with one embodiment of the invention.

Figures 3a, 3b, 3c, 3d, 3e, and 3f are flowcharts illustrating the operation of one embodiment of the identification system of the invention.

Detailed Description of the Invention

The following detailed description is directed to certain specific embodiments of the invention. However, the invention can be embodied in a multitude of different ways as defined and covered by the claims. In this description, reference is made to the drawings wherein like parts are designated with like numerals throughout.

System Overview

Figure 1 is a perspective view of an identification system 50 according to the invention. In one embodiment, the identification system 50 is housed in a photo kiosk. The identification system 50 may be implemented in an enclosed photo booth or an upright, open-face panel which the user can access in a standing or sitting position. If the identification system 50 takes on a panel configuration, such as that illustrated in Figure 1, the identification system 50 may be open or it may comprise a curtain, screen or other blocking structure which is positioned behind the user when he is within a posing region provided by the identification system 50. In one embodiment, the posing region is an area on the ground having dimensions of about two feet by two feet and located in front of the identification system 50, wherein the camera 61 captures an image located three to seven feet above the posing region. However, as can be readily appreciated, the camera 61 may be configured to capture an image of a user in a sitting or reclined position. Further, the posing region may be an area having greater or lesser dimensions than those indicated above. The blocking structure is used to obscure background images within the posing region.

Within the identification system 50, a camera 61 is connected to a computer 70 having a computer housing. Further, the camera 61 is located proximate to a display 60. In one embodiment, the computer 70 is situated near the bottom of the identification system 50. However, the precise location of the computer 70 is unimportant as long as the computer can interface with the other components of the identification system 50. The camera 61 is affixed to the identification system 50 in a manner which allows for the capture of an image of the user who is located within the posing region. In one embodiment of the invention, the camera 61 is a video camera and the user sees a real-time video image of himself on the display 60. The user uses this real time feedback mechanism to determine the proper pose and expression to assume. It is noted that the camera 61 may be an analog or digital camera. In one embodiment, the camera 61 is an analog camera such as, for example, a model number CV-730 NDC marketed by Costar Industries Ltd. of Setayaga, Tokyo, Japan. If an analog model is used, the camera 61 is coupled to a digitizing unit 59 of Figure 2 such as VGA-CTV, part # PV1026-012 marketed by Willow Peripherals of Bronx, NY. The digitizing unit 59 is coupled to a computer 70 which is shown in Figure 1, and is located near the housing of the computer 70. If a digital camera is used, it is not necessary to include a separate digitizing unit 59, since the digital camera houses a digitizer.

The display 60 is mounted in the identification system 50 so as to be visible by the user when the user is within the posing region. The display 60 is connected to the camera 61 via the computer 70. As was discussed above, the display 60 is centrally located on the imaging system 50 so as to provide a display which may be easily visualized by the user who is situated on or near the posing region. In an alternative embodiment of the invention, the camera 61 is directly connected to the computer 70. The display 60 may be one of a variety of known displays such as the PrecisePoint 5800 touch screen display marketed by Mitsubishi Electronics America, Inc. of Cypress, CA.

If payment is required, the identification system 50 includes a payment-receiving device 63 which is connected to the computer 70. The payment-receiving device 63 is centrally located on the computer 70, and proximate to the display 60, to facilitate access by the user, who is situated on or near the posing region. In one

embodiment of the invention, the payment-receiving device 63 is the Diversified Model Global Bill Acceptor (GBA) marketed by Diversified Systems Inc. of North Las Vegas, Nevada. In addition to receiving currency, the payment-receiving device 63 may accept credit cards, debit cards, activation codes or other forms of payment.

The identification system 50 also includes a speaker 68. In one embodiment of the invention, left and right speakers are each respectively affixed to a left and right side of the camera 61. The speaker 68 is coupled to the computer 70 and is used to deliver audible information to the user. The identification system 50 further comprises a printer 65 having a printer bin 66, the printer 65 also being coupled to the computer 70. In one embodiment of the invention, the printer is situated on a right side of the identification system 50 proximate to the computer 70. However, as can be readily appreciated, the exact location of the printer 65 is unimportant as long as the printer 61 can communicate with the computer 70. In one embodiment of the invention, the printer 65 is a Cheetah ID Card Printer marketed by Fargo Electronics Inc. of Fargo, North Dakota.

The identification system 50 includes various devices to facilitate the verification of the identity of a user. These devices include, for example, an input device 62, a scanner 90 which is used to scan documents provided by the user, an electronic signing device 91, and a fingerprint imaging device 92 for scanning a user's fingerprint. The signing device 91 comprises an electronic pad and pen for capturing the user's signature. The input device 62, the scanner 90, the electronic scanning device 91, and the fingerprint imaging device 92 are each connected to the computer 70. Furthermore, the input device 62, the electronic scanning device 91, and the fingerprint imaging device 92 are located on a control panel which is centrally located on the identification system 50 so as to be easily accessible to a user who is standing on or near the posing region. However, it is to be appreciated that the input device 62, the electronic scanning device 91, and the fingerprint imaging device 92 need not be placed on the control panel. In one embodiment of the invention, the scanner 90 is located underneath the control panel. It is also noted that the scanner 90 may be replaced in some embodiments by a facsimile machine.

The fingerprint imaging device 92 may be a Touch View II marketed by Identix Inc. of Sunnyvale, California. Further, the electronic signing device 91 may be the NCR 5991 Signature Capture marketed by NCR Corporation of Dayton, Ohio. The scanner 90 may be the PaperPort MX Scanner marketed by Visioneer Inc. of Fremont, California.

The identification system 50 also includes a transceiver 75 for communicating digital information over a transmission link. The transceiver 75 is proximally located and connected to the computer 70. The transceiver 75 may communicate over any transmission link that supports the transfer of digital information from one point to another. The transmission link may be a public switched telephone network (PSTN), a digital connection such as an ISDN link, or a terrestrial or satellite-based wireless link. The transmission medium passes the digital data directly to the recipient's transceiver or to a service provider such as through the Internet. In one embodiment, the transceiver 75 is a conventional telephone modem such as US Robotics Courier V.Everything Modem marketed by 3Com Corp. of Santa Clara, CA. and the transmission medium is a telephone line. The digital information may also be sent through a network, such as the Internet, to a single recipient or multiple recipients, via SMTP (Simple Mail Transfer Protocol), FTP (File Transfer Protocol), HTTP (HyperText Transfer Protocol), or any other public or proprietary means of sending

data over a network. The identification system 50 comprises a receipt recorder 64, such as the 2590 Kiosk marketed by Axoihm of Ithaca, New York. The receipt recorder 64 is coupled to the computer 70. Further, the receipt recorder 64 is located underneath the control panel and proximate to the scanner 90. The receipt recorder 64 prints user material such as material related to the transmission of digital information from the identification system 50, the cost of the operation, and the content of the transmission, the time at which the transmission is completed, and the time at which receipt of the transmission is completed by the receiving unit or payment information.

The user of the identification system 50 interfaces with the system by means of the input device 62. For example, the input device 62 may be a keyboard, rollerball, mouse, or voice recognition system. The input device 62 may also be a touch screen associated with the display 60. The user responds to prompts on the display 60 by touching the screen. Textual information is entered by the user through the input device 62 such as the keyboard or the touch-screen mechanism.

Figure 2 is a block diagram illustrating the components of one embodiment of the invention. At the core of the invention is the computer 70. In one embodiment, the computer 70 is a personal computer such as an IBM PC compatible computer. The computer 70 has a central processing unit which is capable of operating with a 200 megahertz (MHz) clock signal. Further, the computer 70 has 32 Megabits (MB) of random access memory (RAM). As is noted above, the computer 70 is coupled to the display 60, the digitizing unit 59 and camera 61, the input device 62, the payment-receiving device 63, and the receipt recorder 64. The computer 70 is coupled to the printer 65 through an interface port such as with a Small Computer System Interface (SCSI) port. In addition, the computer 70 is coupled to an electronic storage device 84 such as a hard disk drive. In one embodiment of the invention, the electronic storage device 84 is a hard disk drive capable of storing 2.1 Gigabits (GB) of data. The electronic storage device 84 can store command sequences and integration images as well as other display images and audio files.

As noted above, the transceiver 75 is coupled to a recipient device 80 having a storage 81 and a central processing unit (not shown). The recipient device 80 is coupled to the network 78 by a second transceiver 79. The recipient device 80 comprises a database or sets of user profiles, wherein each of the user profiles contains identifying information on an individual.

The identification system 50 also includes a verification subsystem 87. The verification subsystem 87 includes devices such as: the scanner 90 which is used to scan documents provided by the user, the electronic signing device 91, or the fingerprint imaging device 92 for scanning a user's fingerprint

A system program 95 residing in a memory, such as the electronic storage device 84, controls the operation of the identification system 50. The system program 95 comprises various sub-routines, procedures, definitional statements, and macros which are typically compiled and linked into a single executable program.

Further, another system program 97 residing on the recipient device 80 may control the operation of all or a portion of the verification process. Alternatively, the system program 97 may reside on the computer 70 as part of the system program 95. It is noted that the system program 97, similar to the system program 95, comprises various sub-

routines, procedures, definitional statements, and macros which are typically compiled and linked into a single executable program.

Method of Operation

In combination, Figures 3a, 3b, 3c, 3d, 3e, and 3f illustrate a flowchart showing the detailed operation of an exemplary embodiment of the invention. In one embodiment of the invention, the process flow is controlled by the system program 95 which resides in the memory in the computer 70. Further, each of the states in Figures 3a, 3b, 3c, 3d, 3e and 3f are controlled by a module of the system program 95. Execution begins from a start state 102 of Figure 3a and proceeds to a state 104. At state 104, the display 60 prompts the user to select a function. State 104 remains active until a function is selected by the user in step 106.

In one embodiment, functions available for selection by the user are printing of a personalized document (P), transmission of the image plus any additional information inputted by the user (T) or mailing of an identification document (M). It is to be noted, that in some embodiments of the invention, some of the functionality provided by the invention is not provided to a user. For example, if the identification system 50 needs to verify the identity of the user, the identification system 50 does not allow the user to print an identification document until the user's identity is established. However, if no verification is performed by the identification system 50, the identification system 50 allows the user to simply print the document.

It is also noted that other functions may be incorporated into the identification system 50 such as transmitting of facsimile data, or retrieving images from a remote source. In state 106, the user selects one or more of the available functions. The selected functions, P, M or T, are represented by the function value V in the flowchart of Figures 3a through 3f. Next, in state 108, the function value V is stored in memory.

Based on the selected functions, at a state 110, the computer 70 instructs the display 60 to provide a menu of payment options if payment is required. The computer 70 accesses display data in the electronic storage device 84 and display payment instructions on the display 60. The instructions for payment comprise an exact dollar amount based on the selected functions or a simple prompt to enter credit information. Alternatively, the computer 70 accesses an audio file on the storage device 84 and direct the output of an audible signal over the speaker 68. The process flow pauses at the decision state 112 and await payment for some period of time. If the time period lapses without the entry of payment, the process flow returns to state 104.

If the user decides to make payment, he or she enters payment by inserting currency, a debit card or a credit card into payment-receiving device 63 or by another payment method. If payment is made at the decision state 112, the process proceeds to a state 114, and the identification system 50 tests for correct payment. If proper payment is not made in state 114, the process flow returns to step 104. If payment is correct, the process flow moves to state 116. At state 116, an acknowledgment is sent from the payment receiving device 63 to the computer 70. The process flow then continues through the off-page connectors A 118 and A 120 and resumes again at state 126 in Figure 3b.

In state 126, the computer 70 activates the camera 61. Next, at a state 128, the display 60 begins to display a real-time video depiction of the user. The user manipulates his or her appearance and commands the capture of a particular pose through the input device 62, or the computer 70 commands the capture.

Proceeding to a state 130, if the user is allowed to capture multiple poses, the identification system 50 determines whether the user is going to command the capture of an additional portrait image. If so, the identification system 50 loops back to state 126. However, if at the state 130, the identification system 50 determines that no more portrait images are to be captured, the identification system 50 proceeds to a state 132. In the state 132, the identification system 50 digitizes the captured portrait images by any one of a plurality of well known techniques, if they have been captured in analog form. The computer 70 oversees the conversion of the portrait image into a digital format, or the digitization process occurs at an independent processing entity as shown in Figure 2 as digitizing unit 59. Alternatively, the camera 61 produces a digital image which is used directly by the process.

In state 134, the identification system 50 displays the digitized images on the display 10 and the user is instructed to pick one of the portrait images to be used for the remaining process flow. For example, the user may be asked to touch the selected portrait image on the display 60. In a state 136, the computer 70 receives user input and the selected image is stored in the memory of the computer 70. Due to the nature of the identification document, the images may need to comply with certain parameters defining specific requirements for the size of the image, actual size of the face, and background colors. These requirements can be met by providing mobile cameras, zoom lenses, different curtains or reversible backgrounds, or can be solved using software. Electronic processing techniques for generating first electronic image information from a projected image and for electronically incorporating a background image into the first electronic image information are well known in the art. Details concerning imaging can be found in U.S. Patent No. 5,345,313 entitled IMAGE EDITING SYSTEM FOR TAKING A BACKGROUND AND INSERTING PART OF AN IMAGE THEREIN, issued September 6, 1994, U.S. Patent No. 5,469,536 entitled IMAGE EDITING SYSTEM INCLUDING MASKING CAPABILITY, issued November 21, 1995, U.S. Patent No. 5,577,179 entitled IMAGE EDITING SYSTEM, issued November 19, 1996, and U.S. Patent No. 5,687,306 entitled IMAGE EDITING SYSTEM INCLUDING SIZING FUNCTION, issued November 11, 1997 each of which is assigned to the assignee hereof and incorporated herein by this reference. Another requirement is the specific measurements for the image of the user. These measurements can be accomplished using the function 260 described in U.S. Patent No. 5,577,179 entitled IMAGE EDITING SYSTEM, issued November 19, 1996. Process flow continues from the off-page connector B 138 through the off-page connector B 139 of Figure 3c.

Moving to the state 146, the computer 70 directs process flow dependent on the function value V received from the user at step 106 and stored by the computer 70 in state 108. As stated above, the function value V can be printing (P), transmitting (T), or mailing (M) or a combination of the these functions, depending on the embodiment. If more than one function is selected, the computer 70 selects a first function value V and proceeds to execute the corresponding process flow.

If the function value V is "printing," in a state 148 the computer 70 sends the image to the printer 65 of Figure 1. The user can retrieve his image from the printer bin 66. Process flow continues through connectors O 150 and O 140 to a decision state 142. If the function value V takes on an additional value, decision state 142 directs the process flow back to the state 146. Otherwise, if the function value V does not take on an additional value, the identification system 50 stops in a state 145.

Referring again to the state 146, if the function value V is "transmitting" or "mailing," process flow proceeds through off-page connector C 160 to off-page connector C 161 of Figure 3d. From the off-page connector 161, process flow proceeds to state 162. The states 162 through 178 describe the process by which the identification system 50 receives identifying information from a user. It will be appreciated by one of ordinary skill in the art that, depending on the use of the identification system 50, all of the states 162 through 178 need not be employed to verify the identity of the user.

Now referring to the state 162, the identification system 50 provides an on-line form on the display 60, and the user is instructed to complete the form with personal information, such as first and last name, address, driver's license number and the like. Alternatively or in addition to the foregoing, the information is read by the computer 70 from an ID with a magnetic strip, or is scanned from a document using Optical Character Recognition (OCR) software. In a state 166, the computer 70 receives the user input and stores the information for later use. Next, in a state 168, the computer 70 commands the system to prompt the user to sign the form. For example, in a state 168, the computer 70 accesses an audio file on the electronic storage device 74 and direct the output of an audible signal over the speaker 68, instructing the user to use the electronic pad and pen for signature. Proceeding to a state 170, the computer 70 receives the user input and stores the information for later use.

Moving to a state 172, the computer 70 commands the system to prompt the user to scan his or her fingerprint. The computer 70 accesses an audio file on the electronic storage device 74 and direct the output of an audible signal over the speaker 68, instructing the user in such a manner that a correct set of fingerprints are captured. Other methods of verification of the identity of the user may be included. One of these methods may use a facial recognition system. Facial recognition systems are well known in the art, like the one described in U.S. Patent No. 5,164,992 entitled FACE RECOGNITION SYSTEM, issued November 17, 1992, assigned to the Massachusetts Institute of Technology, Cambridge, MA.

The process flow continues through the off-page connectors D 180 and D 181 and resumes again at state 182 in Figure 3e. At a state 182, the image file is attached to the information gathered in the on-line form, the electronic signature, the captured fingerprint and the scanned documents. The information may be stored in a Joint Photographic Experts Group (JPEG) or other image format.

Next, in a state 184 of Figure 3e, the electronic information and attached image file are queued for transmission through the transceiver 75. Continuing to a state 186, the computer 70 evaluates the function V to determine whether the user has chosen the mailing or transmitting function. It is to be appreciated, that the identification system 50 can be configured to provide less than full functionality, depending on the context in which

the identification system 50 is being used. For example, if the provider of the identification document wishes to provide an additional layer of security, the provider configures the identification system 50 to only allow the mailing of the identification document to the registered address of the user.

If the function value of V is "mailing," at a state 189 the identification system 50 delivers a receipt through the receipt recorder 64 of Figure 1. The receipt has a tracking number which allows the user to follow up the process. The receipt may also include the captured digital image and personal information as well as a space provided for signature. After state 189, process flow continues through connector O 190 and O 140 on Figure 3c to the decision state 142.

Referring again to state 186 of Figure 3e, if the identification system 50 determines that the function value of V is "transmitting," the identification system 50 proceeds to a state 200 and connects to a verification system, which may be the recipient device 80 of Figure 2. The process flow then proceeds through connector E 188 of Figure 3f to a state 210. At a state 210, the identification system 50 sends the identification data to the verification system. The verification process is controlled by the system program 97 of Figure 2. However, it is noted that the verification process can alternatively be performed by the system program 95 on the identification system 50.

Continuing to a decision state 212, the identity of the user is verified. The verification system performs this action through one or more of a plurality of processes including: comparing various identifying information such as, the user's fingerprints, picture, signature, name, or social security number, to a previously recorded set of identifying information that is contained in a database of user profiles.

If the user's identity cannot be identified, the process proceeds to a state 230, and denies the user's request for an identification document. Proceeding to a state 232, the process prints a receipt having a transaction number. The user takes the receipt to a main office and resolve the problem. An agent at the main office uses the transaction number to recall the information which was input by the user at the identification system.

After printing the receipt, the process returns through the off page connector O 233 and O 140 of Figure 3c to the state 142 to determine if the user needs to process additional identification documents. Now, referring again to the decision state 212, if the user's identity can be determined, the process proceeds to the state 214 and transmits an acknowledgment of verification, along with any additional information that is needed, to the identification system 50. Moving to a state 216, the identification system 50 receives the transmission. Next, at a state 218 the identification system prints the identification document. The process then returns to state 140 of Figure 3 through the off-page connectors O 220 and O 140.

It is to be appreciated that the identification system 50 of Figures 1 and 2 can be tailored to provide a variety of documents which require the taking of a photograph or the verification of the identity of an individual. For example, the identification system could be used for obtaining passports, driver's licenses, membership cards, credit cards, smart cards, and travelers checks. The discussion below will focus and further illustrate the process for using the identification system to provide passports and driver's licenses.

Passports

As was discussed above, Figures 3a through 3d provide a generic description of the process for providing an identification document. The discussion below, however, will describe in further detail the acts that occur for these steps in connection with obtaining a passport. In particular, the description below will focus on Figures 3d, 3e, and 3f.

Referring generally to the states 102 through 160 of Figures 3a, 3b, and 3c, the user selects the function V for "transmitting" or "mailing" and the user makes the appropriate payment. Further, the identification system 50 takes the picture of the user.

Now referring to Figure 3d, starting at the state 162, the identification system 50 provides a choice of on-line forms for the user to fill out. Although reference is made below to particular government forms, the identification system 50 can be configured to receive input for any standardized form. The identification system 50 provides a graphical menu for the user to choose an appropriate form depending on the user's situation.

In one embodiment of the invention, the identification system 50 provides two U.S. governmental forms: the DSP-11 and the DSP-82. These forms are used and described for the remainder of the process flow merely for illustrative purposes.

The DSP-11 form is selected if the user never had a U.S. passport, is under age 18, or if the user's most recent passport was lost or stolen. In one embodiment of the invention, the identification system 50 only provides the form DSP-11 at an authorized passport acceptance facility. Alternatively, the identification system 50 can request the user to input the appropriate information for the form DSP-11, and send the information to the acceptance facility. With the user's information entered into the identification system 50, the user proceeds to the acceptance facility, and upon the production of appropriate identification, sign a hard copy of the form.

In yet another embodiment of the invention, the identification system 50 has a registry of user profiles. The identification system 50 compares the identifying information provided at states 168 to 178 of Figure 3d to information maintained in the registry of user profiles to confirm the identity of the user. Further, if the passport was stolen, the identification system 50 has the user fill-out form DSP-64.

Still referring to state 162, if an user desires to renew a previously issued U.S. passport, the user chooses form DSP-82. Traditionally, there are four criteria one must meet in order to use the form DSP-82: (i) the most recent passport is available, (ii) the user was at least 16 years old when the last passport was issued, (iii) the passport was issued less than 12 years ago, and (iv) the user uses the same name as stated on his or her most recent passport, or, has had his or her name changed by marriage or court order and can submit proper documentation to reflect the name change.

After the user has chosen the appropriate form, continuing to the state 164, the identification system 50 guides the user through the process of filling out the selected form. Typical information requested by the identification system 50 is the name, the address, and the countries to be visited. Proceeding to the state 166, the user inputs the requested information. Next, at the state 168 the identification system 50 prompts the user to sign the electronic

signing device 91. Further, at the states 172 and 174, the identification system 50 can optionally scan the user fingerprints.

At the states 176 and 178, the user is then requested to scan appropriate documents depending on the type of form selected. If the user chose in the state 162 the form DSP-82, the user inputs the his or her most recent passport. Otherwise, if the form DSP-11 was chosen, the user submits the appropriate identification such as: a previous U.S. passport, a certified birth certificate, a hospital birth record, early census, school or family Bible records, a newspaper or insurance files, notarized affidavits, a Certificates of Naturalization of user's parents, foreign birth certificates, a Consular report of Birth (Form-FS-240), or a Certification of Birth (Form DS-1350 or FS-545).

Next, at the state 182 of Figure 3e, the images of the user are combined with inputted information, and stored in a new data file. In state 184, data file which includes the electronic information and attached image file are queued for transmission through the transceiver 25.

In state 186, the identification system 50 selects the process flow path depending on the function value of V. If the function value of V is mailing, at a state 189 the identification system 50 commands the delivery of a receipt through the receipt recorder 14. The receipt has a tracking number which allows the user to follow up the process. The receipt also includes the captured digital image and personal information as well as a space provided for signature.

Still referring to state 189 of Figure 3e, the passport for the user will be mailed to the user's registered home address. Alternatively, the user takes the receipt to an issuing agency to pick up a copy of the passport. The issuing agency may be a governmental authority charged with the administration of passports. An agent at the issuing agency downloads the correspondent digital image and additional digital information using the tracking number, reviews collection of information and can optionally enter more information. The user signs the receipt in the presence of the acceptance agent, or use an electronic signing device to sign the on-line form. The agent collects the required original documents and submits the final collection to the issuing office.

Now referring again the state 186, if the value of V is transmitting, the identification system 50 proceeds to the state 200, and the identification system 50 connects to a verification system. Moving to the state 210 on Figure 3f, the identification system 50 transmits the data to the verification system. Next, at the decision state 212, the identification system 50 verifies the identity of the user. In one embodiment, this is accomplished by an agent at the issuing agency who reviews the documents provided by the user and verifies the identity of the user. In another embodiment of the invention, the identity of the user is verified by one or more of the previously discussed verification processes.

If in the decision state 212, the identification system 50 cannot verify the identity of the user, the process proceeds to the state 230, wherein the identification system denies the passport. Continuing to the state 232, the identification system 50 prints a receipt for the user. The user takes the receipt to a customer service representative to follow up and resolve any problems. The customer service representative uses the receipt to retrieve the information inputted by the user. The process then returns to the state 142 of Figure 3c where the user retries the identification process.

Referring again to the decision state 212 of Figure 3f, if the process proceeds to the state 214, an authorization is sent to the identification system 50 which will allow the user to print a passport. Next, at the state 216 the identification system 50 of Figure 1 receives the transmission. Finally, at the state 218 the user prints the passport. The process then returns to the decision state 142 of Figure 3c through the page connector O 220 and the page connector O 140.

Driver's Licenses

As was discussed above, Figures 3a through 3f provide a generic description of the process for providing an identification document. The discussion below, however, will describe in further detail the acts that occur for these steps for obtaining a driver's license. In particular, the description below will focus on Figures 3d, 3e, and 3f.

An individual may need a new driver's license in case the original becomes lost or the license holder changes addresses. Using the identification system 50 of the invention, the driver's license holder can conveniently obtain a replacement to a lost or an outdated card.

Now, referring generally to the states 102 through 160 of Figures 3a, 3b, and 3c, a user of the identification system 50 selects the function V for "transmitting" or "mailing" a driver's license, and the user makes the appropriate payment. Further, the identification system 50 takes the picture of the user. If a recent image of the user is already in the system, it may not be necessary to follow the process through the states 126 through 138 to obtain a new picture; however, a new image can be optionally used for verification purposes or it can also be used as a replacement of an old photograph.

Now, referring to the state 162, the identification system 50 displays a selection of on-line forms. The identification system 50 provides one form for the user to fill out if the user has lost a driver's license. The identification system 50 provides a second form for the user to fill out if the user has changed his or her address. Continuing to a state 164, the identification system 50 prompts the user to complete the form. In the case of a lost driver's license, the on-line form requests the user to input the user's full name, driver's license number and all other pertinent personal information. In the case of a change of address, the second on-line form requests, in addition to the foregoing information, the user's new address. At the state 166, the user inputs the requested information. Moving to a state 168, if the issuer of the identification document requires a signature, the identification system 50 requests the user to sign the signing device. Continuing to the state 170, the user signs his or signature.

Next, at the state 172, the identification system 50 scans the user's fingerprints. After receiving the fingerprints at the state 174, at states 176 and 178 the identification system 50 may be configured, at the option of the issuer of the driver's license, to request the user to input additional identifying information such as various identifying documents.

Moving to the state 182 of Figure 3e, the file with the user's image, if previously recorded, is attached to the information entered by the user. Continuing to the state 184, the electronic information is queued for transmission through the transceiver 25. At state 186, the identification system 50 determines whether the value of function V is

mailing. If the user selected mailing, the process proceeds to state 189, and the identification system 50 prints a receipt with a transaction number. The identification system 50 will generate a message to an issuing office of the driver's license. An agent of the issuing office will then mail a new driver's license to the user.

Alternatively, if the user chose "transmitting," the identification system 50 proceeds to the state 200. At state 200, the identification system 50 connects to a verification system. Next, at the state 210, the inputted data, which together comprises a set of verification data, is transferred to the verification system. The verification system maintains a copy of the verification information for each driver's license holder. The verification information includes but is not limited to: images of one or more user fingerprints, a prior photograph of the user, a voice sample, a home address, a home phone number, a social security number, and a driver's license number. Next, at the decision state 212, the identity of the user is verified. In one embodiment, an agent at the issuing agency does this verification by reviewing the documents provided by the user and verifying the identity of the user. In another embodiment of the invention, the identity of the user is automatically verified by identification system 50 by comparing the verification data to previously recorded verification information. Further, the verification information can be stored in a database or in an other data storage device. The verification system can optionally compare multiple forms of identifying data such as a photograph image and a fingerprint image.

If, in the decision state 212, the identification system 50 cannot verify the identity of the user, the process proceeds to the state 230, wherein the identification system 50 denies the driver's license. Continuing to the state 232, the identification system 50 prints a receipt for the user. The user takes the receipt to a customer service representative to follow up and resolve the problem. The customer service representative uses the receipt to retrieve the information inputted by the user. From the state 232, the process returns to the state 142 of Figure 3c where the user retries the identification process.

Referring again to the decision state 212, if the identification system 50 is able to verify the user's identity, the process proceeds to the state 214. At the state 214, an authorization is sent to the identification system 50 which confirms the identity of the user. Next, at the state 216 the identification system 50 of Figure 1 receives the transmission. Finally, at the state 218 the user prints the driver's license. The process then returns to the decision state 142 of Figure 3c through the page connector 0 220 and the page connector 0 140.

The identification system 50 of the invention advantageously overcomes several problems which are commonly associated with obtaining identification documents. For example, using the identification system 50, a user can conveniently obtain a replacement for a lost or stolen passport, driver's license, credit card or membership card. Moreover, the issuer of the replacement card is able to verifiably determine the identity of the user.

Further, the identification system 50 allows users to receive original identification documents, if the user is able to produce other identifying data such as a driver's license, a signature, or a fingerprint image.

The identification system 50 provides a convenient mechanism by which a user can procure an identification document in a timely manner. A user need not travel to an issuing agency to procure the lost or stolen identification document. Further, since the identification system 50 is automated, the identification system is quicker than

traditional solutions for providing identification documents. Lastly, the cost of providing and training personnel to produce the identification documents are reduced over solutions which require the use of personnel to take photographs, accept money, and print the documents.

While the above detailed description has shown, described, and pointed out novel features of the invention as applied to various embodiments, it will be understood that various omissions, substitutions, and changes in the form and details of the device or process illustrated may be made by those skilled in the art without departing from the spirit of the invention. The scope of the invention is indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

WHAT IS CLAIMED IS:

1. An imaging system for generating an identification document, comprising:

a central processing unit;

a memory storage unit coupled to the central processing unit and configured to store a digital image of a user;

at least one input device coupled to the central processing unit and configured to receive identification data which identifies the user;

a camera coupled to the central processing unit and configured to capture an image;

a verification system which verifies the identity of the user by comparing the identification data from the at least one input device with verification information; and

a printer for generating an identification document in response to an electronic request, wherein the identification document includes the captured image.

2. The system of Claim 1, wherein the at least one input device comprises at least two input devices coupled to the central processing unit and configured to receive identification data which identifies the user.

3. The system of Claim 2, wherein one of the at least two input devices is a scanner.

4. The system of Claim 2, wherein one of the at least two input devices is a keyboard.

5. The system of Claim 2, wherein one of the at least two input devices is an electronic signing device.

6. The system of Claim 2, wherein one of the at least two input devices is a touch-screen monitor.

7. The system of Claim 1, wherein the at least one input device comprises a scanner which scans in documents that describe the identity of the user.

8. The system of Claim 1, wherein the at least one input device comprises an electronic signing device which accepts a signature of the user.

9. The system of Claim 1, wherein the at least one input device comprises a fingerprint imaging device which accepts a fingerprint of the user.

10. The system of Claim 1, wherein the at least one input device comprises a touch screen.

11. The system of Claim 1, wherein the at least one input device comprises a keyboard.

12. The system of Claim 1, wherein the camera captures the portrait image in response to a capture signal activated by the user.

13. The system of Claim 1, wherein the camera captures an image in response to a capture signal activated by the central processing unit.

14. The system of Claim 1, wherein the verification system is a software program which is executing on a second central processing unit.

15. The system of Claim 1, wherein the verification system is a software program which is in communication to the first central processing unit.

16. The system of Claim 1, wherein the identification document is a passport.

17. The system of Claim 1, wherein the identification document is a driving license.

18. An identification system for automatically verifying the identity of a user, the identification system comprising:

a camera which captures an image of the user posed in a region provided at the identification system;

a display positioned so as to be visible to the user when the user is within the region and which provides a real time display of the image captured by the camera;

at least one input device which enables the user to input identifying information;

a central processing unit which converts the image to digital data acceptable for electronic transmission; and

a verification system connected to the central processing unit which upon an electronic request determines the identity of the user by analyzing the image and the identifying information.

19. The system of Claim 18, wherein the at least one input device comprises at least two input devices coupled to the central processing unit and configured to receive identification data which identifies the user.

20. The system of Claim 19, wherein one of the at least two input devices is a scanner.

21. The system of Claim 19, wherein one of the at least two input devices is a keyboard.

22. The system of Claim 19, wherein one of the at least two input devices is an electronic signing device.

23. The system of Claim 19, wherein one of the at least two input devices is a touch-screen monitor.

24. The system of Claim 18, wherein the at least one input device comprises a scanner, which can scan in documents that describe the identity of the user.

25. The system of Claim 18, wherein the at least one input device comprises an electronic signing device which accepts a signature of the user.

26. The system of Claim 18, wherein the at least one input device comprises a touch screen.

27. The system of Claim 18, wherein the at least one input device comprises a keyboard.

28. The system of Claim 18, wherein the at least one input device comprises a fingerprint imaging device which can accept a fingerprint of the user.

29. The system of Claim 18, wherein the camera captures the image in response to a capture signal activated by the user using one of the at least one input devices.

30. The system of Claim 18, wherein the camera captures the image in response to a capture signal activated by the central processing unit.

31. A computerized method of receiving information for the generation of an identification document comprising:

accepting a request for an identification document from a user;

capturing an image of the user within the a posing region;

accepting verification data from the user;

converting the image into electronic data acceptable for electronic transmission;

sending the electronic data and the verification data to an electronic destination so that the image may be accessed electronically by a remote user; and

verifying the identity of the user using the verification data.

32. The method of Claim 31, wherein the step of verifying the identity of the user further comprises comparing a fingerprint image in the data to a set of fingerprints.

33. The method of Claim 31, wherein the step of verifying the identity of the user further comprises comparing the portrait image in the electronic data to a set of portraits.

34. The method of Claim 31, wherein the step of verifying the identity of the user further comprises comparing a signature of the user to a set of signatures.

35. The method of Claim 31, further comprising printing an identification document upon receiving an electronic authorization from the electronic destination.

36. The method of Claim 35, wherein the step of printing the identification document further comprises printing a driver's license.

37. The method of Claim 35, wherein the step of printing the identification document further comprises printing a credit card.

38. The method of Claim 35, wherein the step of printing the identification document further comprises printing a passport.

39. The method of Claim 35, wherein the step of printing the identification document further comprises printing a membership identification card.

40. The method of Claim 35, further comprising the steps of:
activating a camera to display a real-time image on a display unit; and
receiving user input to control the step of capturing the image.

41. The method of Claim 31, further comprising the step of demanding user payment.

42. A computerized method of generating an identification document for a user, comprising:
receiving an electronic request for the generation of an identification document;
receiving identifying information from the user;

digitizing the information;

verifying the identity of the user by electronically comparing the digitized information to a set of verification information; and

printing the identification document, wherein the identification document includes the identifying information.

43. The method of Claim 42, wherein the step of verifying the identity of the user further includes comparing a fingerprint image in the identifying information to a set of fingerprints.

44. The method of Claim 42, wherein the step of verifying the identity of the user further includes comparing the image in the file to a database of images.

45. The method of Claim 42, wherein the step of verifying the identity of the user further includes comparing a signature in the identifying information to a set of signatures.

46. The method of Claim 42, further comprising the step of receiving a capture signal from the user which instructs the camera to capture an image of the user, which is analyzed in the verifying step.

47. The method of Claim 42, wherein the step of verifying the identity further comprises the step of sending the digitized information through a network to a remote destination for verification of the user at the remote destination.

48. The method of Claim 42, wherein the step of sending the digitized information further comprises the step of sending the digitized information over a wireless link.

49. The method of Claim 42, wherein the step of sending the digitized information further comprises the step of sending the digitized information over a telephone system.

50. The method of Claim 42, further comprising the step of receiving textual information from the user and wherein the step of verifying further comprises the step of sending the textual information with the digitized information to an electronic destination which maintains a database of identifying information.

51. The method of Claim 42, further comprising the step of outputting audible instructions to the user.

52. The method of Claim 42, further comprising the step of receiving payment from the user.

53. A system for generating an identification document for a user, comprising:

means for receiving a request for the generation of an identification document;

means for receiving identifying information from the user;

means for verifying the identity of the user; and

means for printing the identification document.

54. An imaging apparatus for generating an identification document for a user, comprising:

a central processing unit;

a memory storage unit coupled to the central processing unit and configured to store a digital image of a user;

a fingerprint imaging device coupled to the central processing unit and configured to receive at least one fingerprint image;

a camera coupled to the central processing unit and configured to capture an image;

a verification system which verifies the identity of the user by comparing the at least one fingerprint image with a set of verification information, and wherein the verification system compares the image of the user to the set of identifying information; and

a printer for generating an identification document, wherein the identification document includes the image.

55. The apparatus of Claim 54, further comprising a kiosk which houses the central processing unit, the memory storage unit, the fingerprint imaging device, and the camera.

56. The apparatus of Claim 54, wherein the camera is a video camera coupled to a display unit so as to provide a real-time image of a user, and wherein the central processing unit receives input from the user indicating an image selection based on the real-time image.

57. The apparatus of Claim 54, further comprising a payment receiving device which accepts user payment.

58. An imaging system which determines an identity of a user, comprising:

a central processing unit;

at least one input device coupled to the central processing unit and configured to receive identification data which identifies the user; and

a verification system which verifies the identity of the user by comparing the identification data from the at least one input device with verification information to determine whether an identification document may be produced.

59. The system of Claim 58, wherein the at least one input device comprises at least two input devices coupled to the central processing unit and configured to receive identification data which identifies the user.

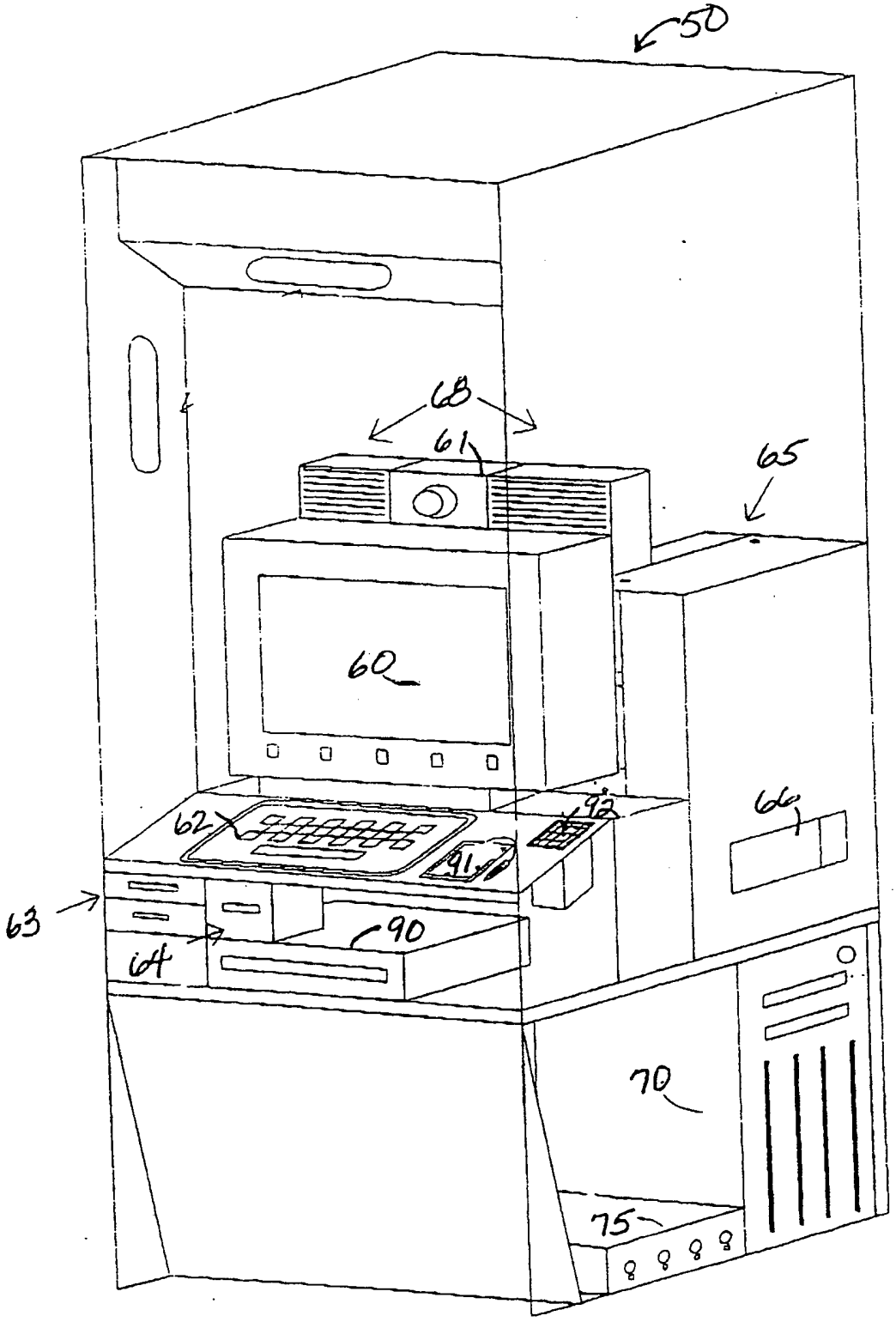

FIG. 1

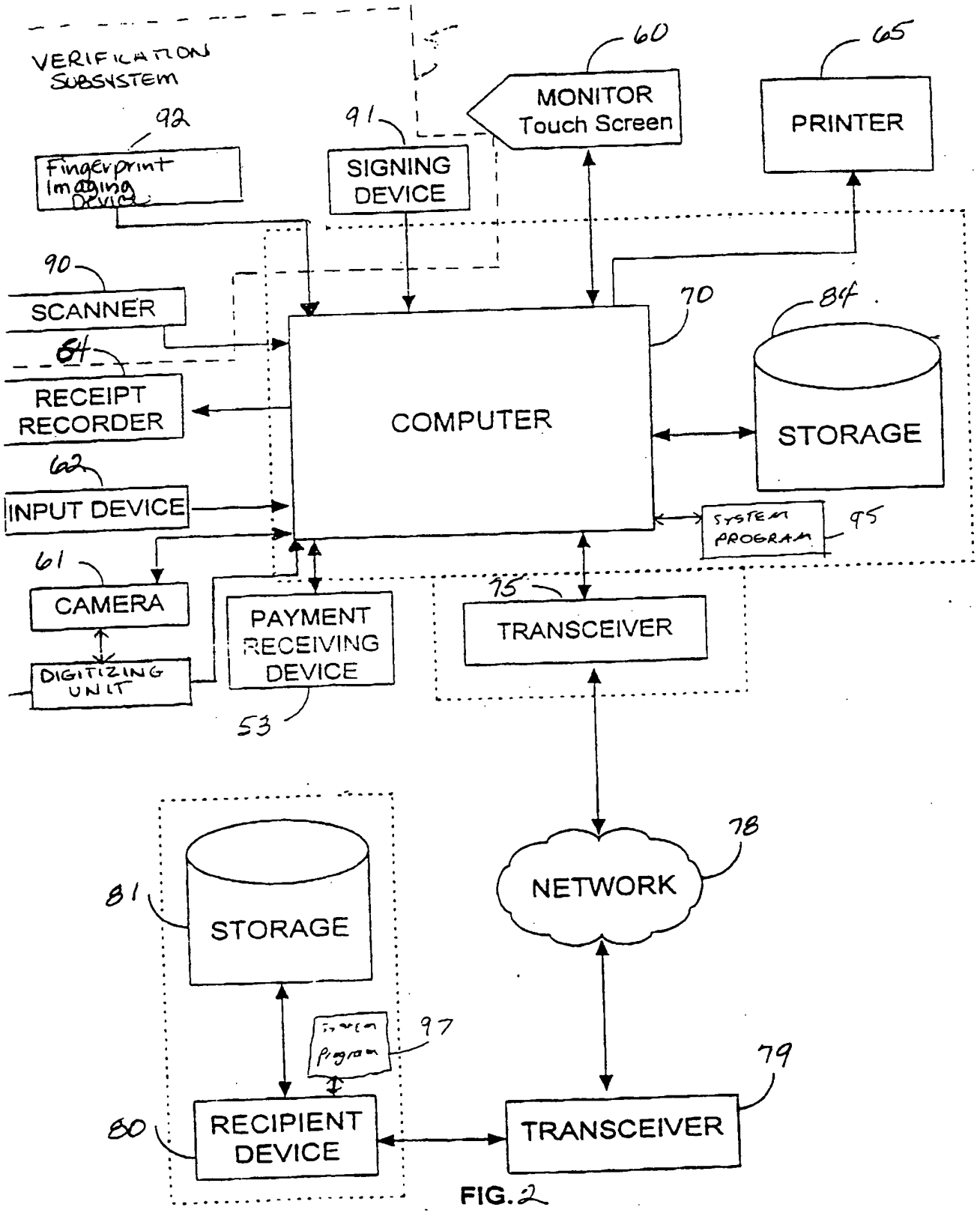
VERIFICATION SUBSYSTEM
92
Fingerprint Imaging Device
91
SIGNING DEVICE
60
MONITOR Touch Screen
65
PRINTER
90
SCANNER
64
RECEIPT RECORDER
70
COMPUTER
84
STORAGE
62
INPUT DEVICE
SYSTEM PROGRAM
95
61
CAMERA
DIGITIZING UNIT
PAYMENT RECEIVING DEVICE
53
75
TRANSCEIVER
78
NETWORK
81
STORAGE
97
79
80
RECIPIENT DEVICE
TRANSCEIVER

FIG. 2

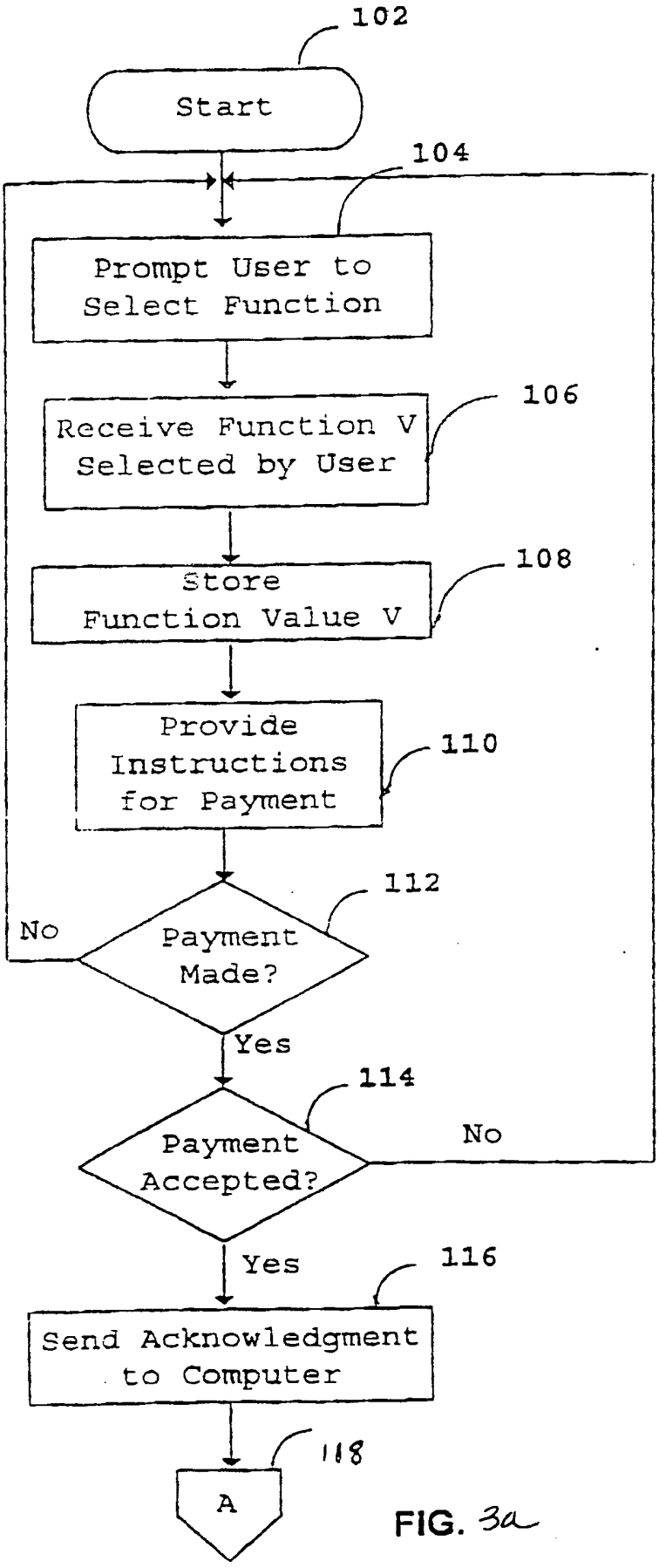
102
Start
104
Prompt User to Select Function
Receive Function V Selected by User
106
Store Function Value V
108
Provide Instructions for Payment
110
112
No
Payment Made?
Yes
114
Payment Accepted?
No
Yes
116
Send Acknowledgment to Computer
118
A

FIG. 3a

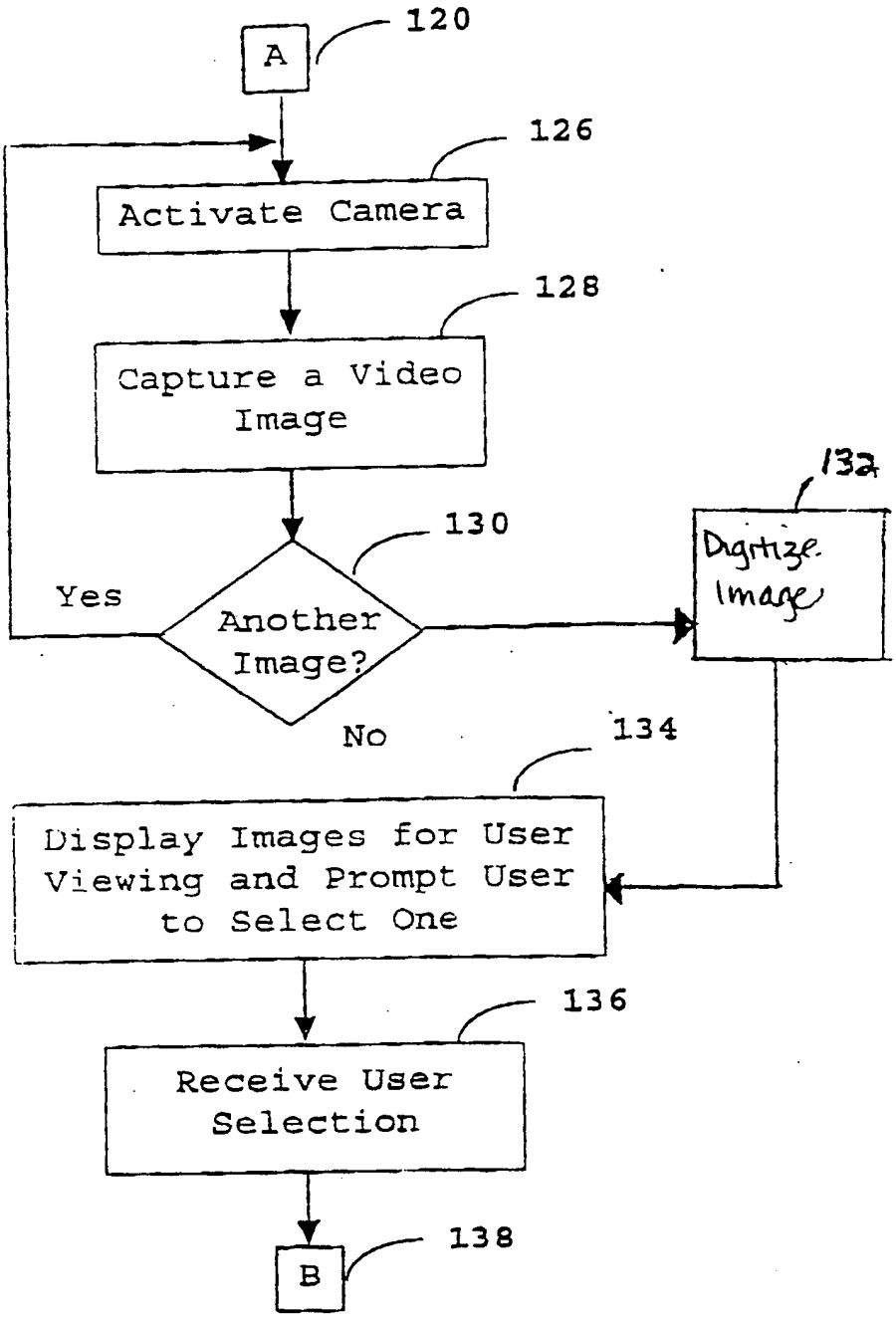
A
120
126
Activate Camera
128
Capture a Video Image
130
Another Image?
Yes
No
132
Digitize Image
134
Display Images for User Viewing and Prompt User to Select One
136
Receive User Selection
B
138

FIG. 3b

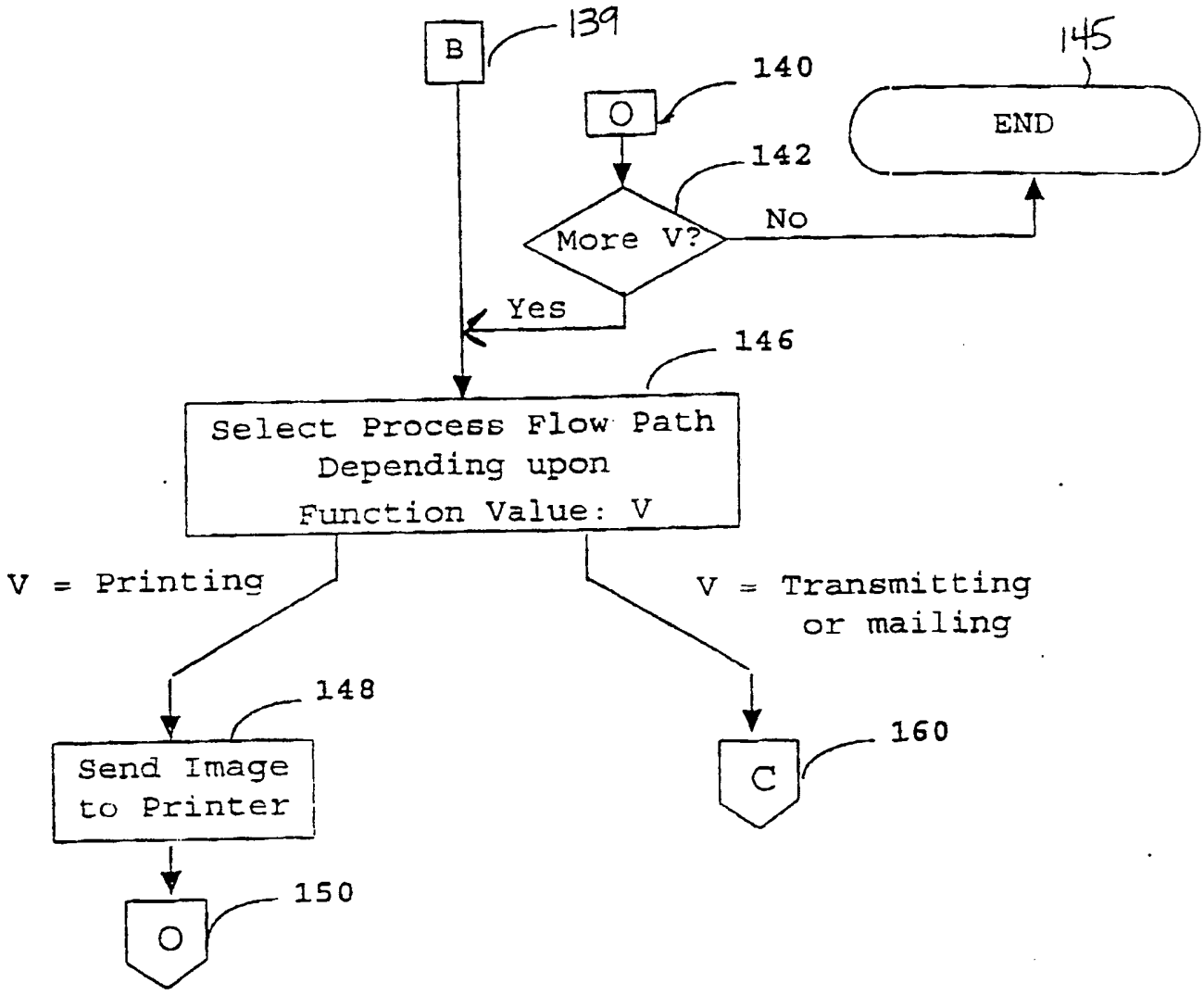
B
139
140
O
142
More V?
No
145
END
Yes
146
Select Process Flow Path
Depending upon
Function Value: V
V = Printing
V = Transmitting
or mailing
148
Send Image
to Printer
150
O
160
C

FIG. 3C

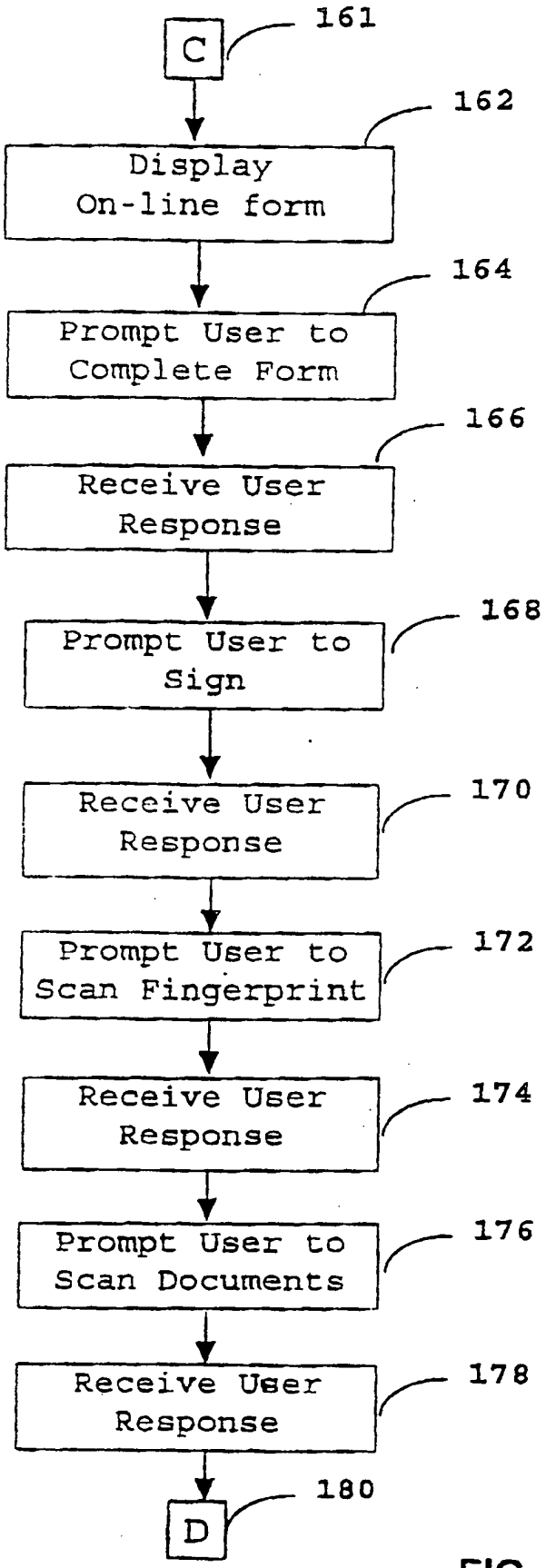
C
161
162
Display On-line form
164
Prompt User to Complete Form
166
Receive User Response
168
Prompt User to Sign
170
Receive User Response
172
Prompt User to Scan Fingerprint
174
Receive User Response
176
Prompt User to Scan Documents
178
Receive User Response
180
D

FIG. 3d

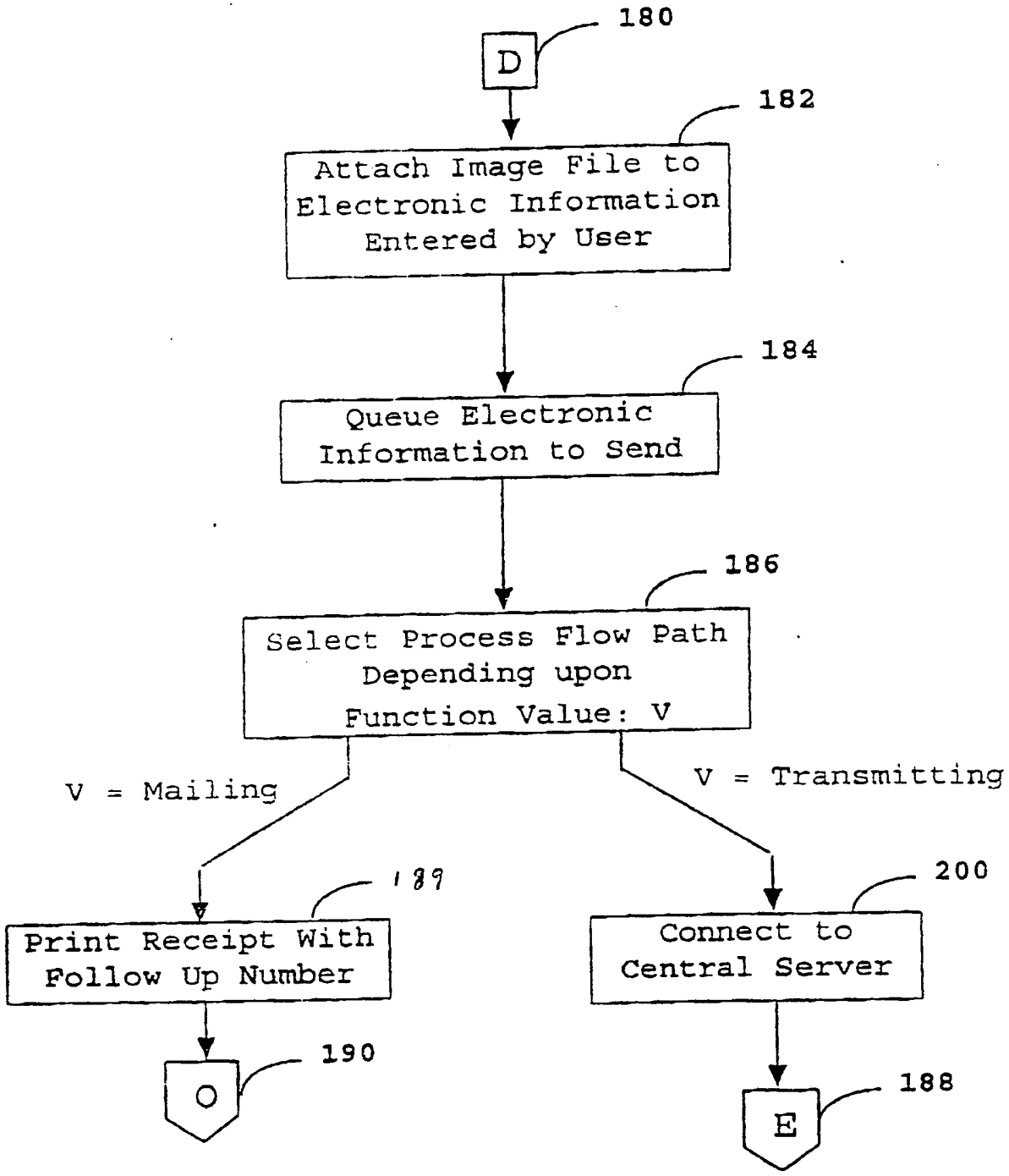
180
D
182
Attach Image File to Electronic Information Entered by User
184
Queue Electronic Information to Send
186
Select Process Flow Path Depending upon Function Value: V
V = Mailing
V = Transmitting
189
Print Receipt With Follow Up Number
200
Connect to Central Server
190
O
188
E

FIG. 3e

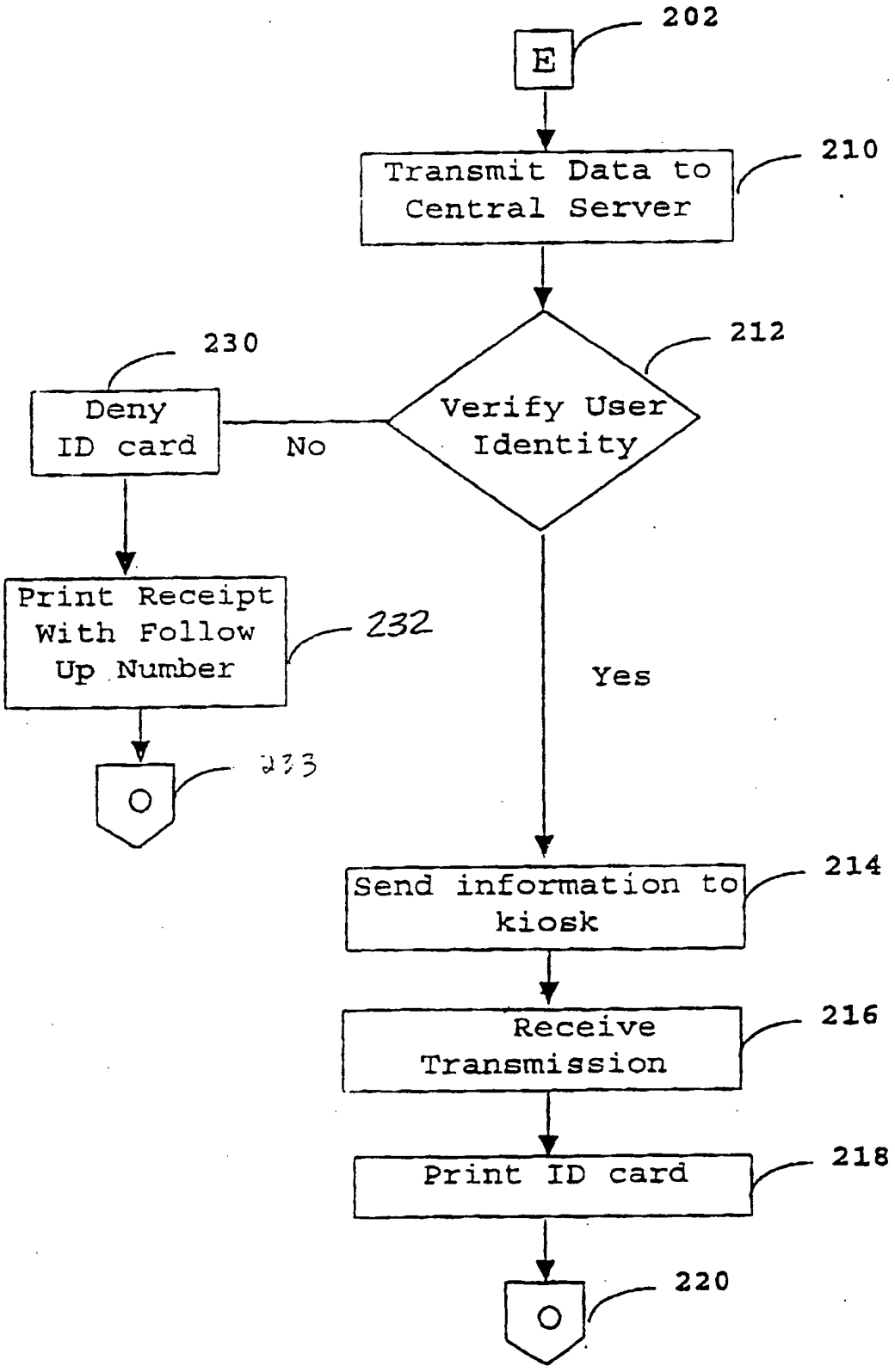
202
E
Transmit Data to Central Server
210
Verify User Identity
212
No
230
Deny ID card
Print Receipt With Follow Up Number
232
233
O
Yes
Send information to kiosk
214
Receive Transmission
216
Print ID card
218
220
O

FIG. 3f

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/13735

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) : G06K 9/00; B42D 15/00; H04K 1/00
US CL :382/115, 116; 283/72, 77, 78; 380/ 23, 24, 25
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 382/115

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LINDQVIST et al. Application For Canadian Patent No.2, 142,227. 11 August 1996. page 14, lines 10-20, page 15, lines 1-7, page 44, lines 11-26 and Figs 1, 6.	18-30, 58-59
X	US 5,717,776 A (WATANABE) 10 February 1998, col. 2, lines 34-39; col. 4, lines 18-36; Figs. 4 and 10A	1-17, 31-57
X	US 5,259,025 (MONROE et al) 02 November 1993, Abstract, Figs 8, 9, and 10	18-30, 58-59

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
06 AUGUST 1999

Date of mailing of the international search report
13 SEP 1999

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Authorized officer
SAMIR AHMED James R. Matthews

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/13735

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2 ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1 ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/13735

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

Group I, claim(s)1-17, 31-57, drawn to a system, apparatus and computer method for generating an identification document.
Group II, claim(s) 18-30, 58-59, drawn to an imaging system for identifying a user.
The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:the two groups of inventions are not linked as to form a single general inventive concept.